signal conditioning module (EMG-8, EMG System do Brasil®, SP, Brazil), featuring an analogue-to-digital converter with 12-bit resolution. Each channel had a 100x gain, a Butterworth filter at a bandwidth of 20 to 400 Hz and common-mode rejection of 100 dB. After trichotomy and cleaning of the skin, two disposable, self-adhesive 20x gain Ag/AgCl preamplified surface electrodes (Medi-Trace™, Kendall, Mansfield, USA) were attached over the muscle belly 20 mm apart, according to SENIAM recommendations. The reference electrode was placed on the wrist. Data were recorded with an acquisition frequency of 1000 Hz per channel and with AqDados data acquisition software (Linx, Br.). The data were then normalized by the electromyographic activity obtained during maximal isometric contraction (isometric contraction was performed prior to the isokinetic tests, with the knee at 60 ° flexion, during 10s). The vastus lateralis electromyiograph data were processed using MatLab® (version 7.0.1, MathWorks Inc., Natick, USA). The electromyography signals were band-pass filtered using a second-order zero-lag Butterworth filter at 20 to 400 Hz. The integral of the electromyography signal (Iemg) for vastus lateralis was calculated for the time interval during which the knee was positioned between 30 and 70°. This period was identified from the data obtained on the range of motion of the dynamometer and was stored with the EMG signals. The physical function section of the Western Ontario and MacMaster Universities Osteoarthritis Index (WOMAC) was used to assess self-reported physical function. For the intergroup analysis was used the independent t-test for data with a normal distribution. The Mann-Whitney U test was used for data without a normal distribution (α<0.05).

Results: The groups were homogeneous for age (p=0,41), weight (p=0,99), height (p=0,25) and BMI (p=0,46). According to intergroup analysis, the present study showed that men with early degrees of knee OA had higher scores of the physical function section of WOMAC questionnaire (p=0,000), indicating worse physical function. Individuals with knee OA have reduced eccentric knee extensor peak torque (p=0,009), accompanied by reduction in eccentric Iemg of the VL muscle(p=0,004). However, these individuals did not present differences in concentric knee extensor peak torque (p=0,569) or concentric Iemg (p=0,198) compared to CG.

Conclusions: We emphasize the relevance of our results, which indicate that participants in this study have lower muscle activation associated with a reduction in the eccentric contraction of the knee extensors. Associated with VL inhibition and decrease in the eccentric strength of the quadriceps muscle, impairment of activities of daily living is present in these individuals. Early identification of these changes may help in the planning of rehabilitation programs that aim to control the functional changes resulting from the presence of knee OA in its early stages. Therefore, we can conclude that men with early-stage knee OA already have concomitant electrical activity and performance deficits of the quadriceps muscle. For future studies it suggested that eccentric training of the knee extensor muscles could be emphasized, starting in the early stages of the disease.

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FUNCTIONAL IMPAIRMENTS EXIST BILATERALLY, ARE RELATED TO HIP MUSCLE STRENGTH AND PREDICT PATIENT-REPORTED OUTCOMES IN PATIENTS WITH CHONDROLABRAL PATHOLOGY

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Purpose: Hip arthroscopy is commonly performed on patients with femoroacetabular impingement (FAI) and early-onset hip osteoarthritis (OA), observed as chondrolabral pathology. However, it is unknown whether patients have residual functional deficits post-surgery, or whether such impairments are related to co-existing strength deficits or patient reported outcomes. The aims of this study were to: (i) compare the between-limb differences in functional performance tests between people with chondrolabral pathology 1-2 years post hip arthroscopy and age matched healthy controls; (ii) evaluate the relationship between functional performance and hip strength and (iii) determine whether and measures of functional performance were associated with patient-reported outcomes in people with chondrolabral pathology.

Methods: This cross-sectional study was undertaken in a physiotherapy practice in Hobart, Australia. Seventy-one patients with hip chondrolabral pathology (40 (56%) women; age=39±11; height=1.74±0.09m; weight=78±13kg; BMI=27±6kg/m2) who underwent unilateral hip arthroscopy 1-2 years prior for hip pain by a single surgeon were recruited. Sixty age-matched controls (41 (68%) women; age=36±10; height=1.71±0.09m; weight=70±12kg; BMI=23±3kg/m2) with no history of hip surgery or pain in the past 6 months were recruited from the community. Patients' characteristics, patient-reported outcome measures (PROs) functional performance and hip muscle strength were collected 12-24 months post-surgery. PROs included the symptoms and function and the social subscales of the International Hip Outcome Tool (iHOT-33). Functional performance tests included the single leg hop (hop) test, the side bridge (bridge) test and the one leg rise (rise) test. Strength tests were conducted using published reliable methods that utilised a hand-held dynamometer. For Aim 1, between-limb differences were compared between the two groups using repeated measures analyses of co-variance (ANCOVA). For Aim 2, Pearson's correlation coefficients (r) and stepwise multiple linear regression analyses (co-variates of age, sex and severity of chondropathy) were used to determine the relationship between the between functional performance measures (surgical leg) and hip muscle strength in the chondrolabral group. For Aim 3, Pearson's correlation coefficients (r) and stepwise multiple linear regressions were used to determine the relationship between functional performance measures (surgical leg) and the PROs in the chondrolabral group, ($p < 0.05$).

Results: For the rise test, the chondrolabral group had significantly poorer performance on both the surgical (MD (95%CI) 14 (8 to 19) rises); and the non-surgical side (14 (8 to 19) rises) compared to controls. For the hop test, the chondrolabral group had a significantly shorter hop than the controls for both the surgical (32 (21 to 42)cm); and the non-surgical lower-limb(37(27 to 47)cm). For the bridge test, the chondrolabral group had significantly worse performance than the controls on the surgical (23(10 to 36) seconds) and the non-surgical side (24(11 to 37) seconds).

In the chondrolabral group, greater strength in hip abduction predicted better performance on the rise test (adjusted r2 0.310 p<0.001); greater hip adductor strength and sex predicted better performance in the bridge test (adjusted r2 0.547 p<0.001); and greater hip adductor and extensor strength, and age and sex predicted better performance in the hop test (adjusted r2 ranges 0.407 to 0.613 p<0.001). In addition, better performance on the bridge test and hop test (adjusted r2 ranges 0.285 to 0.481 p<0.001), were associated with better PRO scores.

Conclusions: Patients with hip chondrolabral pathology have bilateral impairments on functional performance tests 12-24 months after unilateral hip arthroscopy compared to controls. In patients with chondrolabral pathology, greater strength in hip abduction, adduction and extension were associated with better functional performance, while better performance in the bridge and hop tests were associated with better PROs. This information suggests that rehabilitation programs for patients with chondrolabral pathology should utilize retraining, including hip strength exercises to restore functional performance in order to optimise outcomes. These findings may guide clinicians in designing targeted rehabilitation programs that optimise PROs for these patients.

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OPTIMIZATION OF ANALGESICS ALLOWS PATIENTS WITH KNEE OSTEOARTHRITIS AND SEVERE PAIN TO PARTICIPATE IN EXERCISE THERAPY

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Purpose: Severe knee pain in patients with knee osteoarthritis hampers the ability to exercise. An intervention protocol which combines analgesics and exercise therapy was developed. The aims of the present